

PERFORMANCE SPECIFICATION

TELESCOPE ASSEMBLY, BORESIGHT, COMMON

This specification is approved for use by the U.S. Army Armament Research, Development and Engineering Center, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification establishes the performance and design requirements for the Boresight Telescope Assembly and the Muzzle Boresight Device that uses a common telescope.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are needed to meet the requirements specified in sections 3, 4, and 5 of this specification. This section does not include documents in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all requirements documents cited in sections 3, 4, and 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document, should be addressed to: Commander, U.S. Army ARDEC, ATTN: AMSTA-AR-EDE-S, Picatinny Arsenal, New Jersey 07806-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

SPECIFICATIONS

FEDERAL

A-A-1898	Cushion Material, Cellulosic, Packaging
BB-N-411	Nitrogen, Technical
ZZ-V-25	Valves and Valve Spuds, Caps, and Cores, Pneumatic Tires

DEPARTMENT OF DEFENSE

MIL-C-675	Coating of Glass Optical Elements
MIL-O-13830	Optical Components for Fire Control Instruments, General Specification Governing The Manufacture, Assembly, And Inspection of

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-171	Finishing of Metal and Wood Surface
MIL-STD-810	Environmental Test Methods
MS20813	Cap, Pneumatic, Valve, High Pressure
MS51607	Valve Stems, Purging

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from DODSSP - Customer Service, Standardization Documents Order Desk, 700 Robbins Avenue, Bldg. 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWINGS

US ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER (ARDEC)

Drawings for the Bradley Gun Systems

5910791	Streamer Assembly, Boresight
12524001	Barrel Assembly

MIL-PRF-71223.

11825986	Barrel, Gun
12524004	Brake, Muzzle
12524144	Adapter Assy, Boresight
12524490	Barrel, 25 mm
12524491	Brake, Muzzle
11826002	Flash Hider
12524142	Boresight Adapter
12524008	Gun, Automatic, 25mm, M242 (Reference)
11826004	Machine Gun, 7.62mm, M240C (Reference)
12977226	Carrying Case
12295919	Housing, Launcher

Drawings for Abrams Tank Weapon Systems

5910791	Streamer Assembly, Boresight
12528311	Tube, Gun M256 (120mm)
11579696	Tube, Gun M68 (105mm)
12956803	Assembly, Case for M26A2/M27A2 MBD (Reference)

(Copies of other Government documents, drawings, and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.3 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM D1974	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
ASTM D3951	Standard Practice for Commercial Packaging

(Application for copies of ASTM publications should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained. (See contract provisions for additional precedence criteria).

3. REQUIREMENTS

3.1 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection in accordance with the technical provisions herein (see 4.3).

3.2 Item definition. The Bradley Boresight Telescope Assembly, herein referred to as the BTA, shall consist of a telescope and an interface device. The BTA shall provide the means to perform the critical function of boresight alignment of the Bradley Fighting Vehicle (BFV) weapons system during fire control system calibration procedures. The BTA shall have the necessary features to allow usage during day or night field operations. The BFV Weapons System consists of the M242 (25mm) Main Gun, M240 (7.62mm) Coaxial Machine Gun, and the Tube Launched-Optically Tracked-Wire Guided Missile System (TOW). The Tank Muzzle Boresight Devices, herein referred to as the MBDs, shall each consist of the same telescope as the BTA but with a different permanently attached interfacing device. The M26A2 shall provide the means to perform the critical function of boresight alignment of the M1 Tank weapon system, and the M27A2 MBD shall provide the means to perform the critical function of boresight alignment of the M1A1 /M1A2 tank weapon system during fire control system calibration procedures. The M1 and M1A1/M1A2 Abrams Tank Family of Vehicles (FOVs) consist of the 105mm and the 120mm Main Gun respectively. The M26A2 MBD shall be capable of interfacing with the 105 mm gun tube only and shall be referred to as such. The M27A2 MBD shall be capable of interfacing with the 120mm gun tube only and shall be referred to as such. Both MBDs shall have the necessary features to allow usage during the day or night operations. The M26A2 and M27A2 MBD shall be cased in a Carrying Case (CC) identical or similar to that shown in drawing 12956803.

3.3 Performance characteristics.

3.3.1 Collimation. Collimation error, defined as the angular difference in the alignment of the optical axis with the mechanical axis, shall not exceed 20 seconds of arc.

3.3.2 Collimation repeatability. The collimation repeatability error shall not exceed 10 second arc. All measurements must meet the collimation requirement of 3.3.1.

3.3.3 Parallax. Maximum allowable parallax at 1000 meters +/- 200 shall not exceed 10 second arc.

3.3.4 Field of view (FOV). The FOV shall be 4 degrees minimum.

3.3.5 Resolution. The resolution through the eyepiece shall be better than or equal to 10 seconds of arc in the center of the field of view.

3.3.6 Focusing range. The focusing range shall be from 200 meters to infinity.

3.3.7 Magnification. The magnification shall be 10X minimum.

3.3.8 Dioptr range. The eyepiece focus shall be adjustable over the range of +/- 4 diopters as read on the diopter scale. The zero of the diopter scale shall indicate zero diopter within 0.25 diopter.

3.3.9 Sealing. The telescope shall show no evidence of leakage in excess of 7.031 gram force (gf)/ cm² (.1 psig) for a period of one (1) hour after pressurizing to the telescope per the requirements of 3.4.9.

3.4 Physical characteristics.

3.4.1 BTA interface requirement. The BTA shall consist of an interface device integral to the design of the telescope that shall allow for accurate boresight alignment of the M240 Coaxial Machine Gun, P/N 11826004 (also see Barrel Assembly, P/N 11825986) and TOW (see Launcher Housing, P/N 12295919), and an interface adapter used for boresight alignment of the M242 Main Gun, P/N 12524008 (also see Gun Barrel, P/N 12524490 and 12524001), original and current versions. The M242 Main Gun interface adapter shall be easily removable from its mating surfaces. Design of the telescope's interface device shall be such that it is also able to interface with the existing 25mm Boresight Adapter assembly, PN 12524144. Design of the BTA telescope's interface device and the M242 Main Gun interface adapter shall account for possible interface interference of external gun attachments, i.e. : flash suppressors, muzzle brakes (P/Ns 12524004 and 12524491). The M240 and uses flash hider (P/N 11826002). Warning Streamer, PN 5910791, shall be able to be securely attached to the BTA telescope.

3.4.2 MBD interface requirement. The M26A2 MBD shall consist of an interface device permanently attached to the common telescope and shall allow for accurate boresight alignment of the 105mm Main Gun (P/N 11579696). Similarly, the M27A2 MBD shall consist of an interface device permanently attached to the common telescope and shall allow for accurate boresight alignment of the 120mm Main Gun (P/N 12528311). Warning Streamer, PN 5910791, shall be able to be securely attached to the common telescope. For user interface, the requirements are as follow: Both MBDs shall be marked with 1/32 inch wide but highlighted with white paint on the adapter cone provide means of alignment with the 12 o'clock and 6 o'clock dimples on the face of the gun tube; the expanding collet shall be permanently pinned to the case plate of the MBD to prevent any relative rotation; the objective lens cover shall be black in color and shall have a 3/16 inch centered hole to minimize parallax; all adjustment screws shall have standard slotted or Phillips heads. A circular plate shall be mounted on the body of the operating handle to provide the means of making its position relative to the 12 o'clock or 6 o'clock dimple on the face of the gun tube.

3.4.3 Optical components. All optical elements, components and assemblies shall comply with the requirements of MIL-O-13830.

3.4.4 Optical coating. The lens elements shall meet the requirements of MIL-C-675.

3.4.5 Reticle. The reticle shall have a clearly defined aiming index and shall be visible at

night without the use of generated or stored electricity in the device itself, with no other marks on the lens. The reticle shall not contain tritium and shall be visible with the use of an external light source such as a flashlight.

3.4.6 Reticle adjustment. Reticle adjustment shall be accomplished with the use of externally situated elevation and azimuth control knobs. Elevation shall be adjustable using a single elevation control knob, and azimuth shall be adjustable using a single azimuth control knob. These knobs shall be protected from accidental disruption and shall provide ease of adjustment by an individual wearing a Nuclear, Biological and Chemical protective equipment such as a pair of gloves.

3.4.7 Eye relief. The eye relief shall be 12.0 mm minimum in diameter.

3.4.8 Exit pupil. The exit pupil shall be 2.5 mm minimum in diameter.

3.4.9 Pressurization. The interior of telescope shall be pressurized to an internal pressure of $351.5 \pm 7.031 \text{ gf/cm}^2$ ($5.0 \pm .1 \text{ psig}$) with nitrogen gas conforming to BB-N-411, type I, class I, grade B with a dew point less than -31.6°C (-25°F).

3.4.10 Purging. The purging of the telescope shall be accomplished through the use of a valve stem, MS51607-1; valve core, ZZ-V-25 type V, class 2 and cap, MS20813-1.

3.4.11 Finish. For aluminum components, the BTA/MBDs shall have a protective finish of 7.1.2 or 7.2.2 (black) of MIL-STD-171. For steel surfaces, the BTA/MBDs shall have a protective finish of 5.1.1 plus 20.24 of MIL-STD-171. For surfaces interfacing with gun bore, a wear finish of nickel or chromium plating shall be applied per 1.4.3.2 or 1.2.2 of MIL-STD-171 respectively. Thickness of plating shall be sufficient to meet the requirements of 3.4.7.

3.4.12 Lubricant. All moving parts of the BTA and MBD shall be lubricated with a suitable lubricant which permits an operating range of temperature from -31.7°C to $+51.7^\circ \text{C}$ (-25°F to $+125^\circ \text{F}$).

3.5 Environmental.

3.5.1 Operating temperature. The BTA, and both M26A2 and M27A2 MBDs shall meet the requirements of 3.3 during and after having been exposed at the operating temperature of -31.7°C and $+51.7^\circ \text{C}$ (-25°F and $+125^\circ \text{F}$).

3.5.2 Storage temperature. The BTA and both M26A2 and M27A2 MBDs shall meet the requirements of 3.3 after having been exposed and thermally stabilized in the CC at temperatures of -53.9°C and $+71.1^\circ \text{C}$ (-65°F and $+160^\circ \text{F}$).

3.5.3 Vibration. The BTA and both M26A2 and M27A2 MBDs cased in the CCs shall meet the requirements of 3.3 after being subjected to vibration of magnitude and frequencies specified in Table I, Vibration Levels.

3.5.4 Shock. The BTA and both M26A2 and M27A2 MBDs shall meet the requirements of 3.3 after having been exposed in their CCs to three shock impulses of 30 +/- 3g's and 40 +/- 4 g's respectively, 11.0 +/- 1.1 milliseconds (ms) half sine wave applied in each direction of 3 mutually perpendicular axes.

TABLE I. VIBRATION LEVELS

Axis	Frequency (Hz)	Amplitude
All	2.7 to 5.5	1.0" DA
	5.5 to 38	+/- 1.5g
	38 to 50	.002" DA
	50 to 200	+/- 2.5g

Note: DA - double axis
g - gravity force

3.5.4.1 Bench handling shock. The BTA and both M26A2 and M27A2 MBDs shall meet the requirements of 3.3 after being subjected to bench handling shock as specified in method 516, procedure VI of MIL-STD-810.

3.5.5 Altitude. The BTA and M26A2 and M27A2 MBDs shall meet the requirements of 3.3 after exposure to an atmospheric pressure equivalent to 12,192 meters (40,000 feet) above sea level for not less than one hour.

3.5.6 Humidity. The BTA and both M26A2 and M27A2 MBDs shall show no evidence of internal moisture during and after exposure of up to 100% relative humidity. The BTA and both MBDs shall meet the requirements of 3.3.1 during exposure and requirements of 3.3 after exposure of up to 100% relative humidity.

3.5.7 Salt fog. The BTA and M26A2 and M27A2 MBDs shall meet the requirements of 3.3 after being exposed to a 5% sodium chloride atomized spray for not less than 48 hours outside the CC. There shall be no evidence of corrosion on the BTA, MBDs, or the CC.

3.5.8 Dust. The BTA and M26A2 and M27A2 MBDs shall meet the requirements of 3.3 after being exposed to moving dust for not less than 12 hours at velocities up to 533.4 meters per minute (1750 feet per minute).

3.6 Workmanship. All optical and mechanical parts of the BTA and MBDs and mechanical parts of the CC shall be free from broken parts, poor workmanship or functionality. When a focus target is viewed through the eyepiece end, there shall be no scratches, chips or coating deterioration which would distract the observer. All burrs, sharp edges and excess material that are discernible to the user shall be removed.

3.7 Markings. The BTA and MBDs shall be marked for identification in accordance with

MIL-STD-130 and shall contain the following information:

- a. Model name/number
- b. Manufacturer's name and Cage Code
- c. Contract Number
- d. National Stock Number
- e. Part Number. For the M26A2 MBD, the part number shall be : "50D1438G1-105MM". For the M27A2 MBD, the part number shall be: "50D1438G2-120MM".
- f. Serial Number

4. VERIFICATION

4.1 Sub-contracts. The contractor shall be responsible for compliance with all requirements of the contract, the drawings and specifications on the part of the sub-contractors, including those who supply raw materials; evidence of such compliance shall be supplied by the contractor.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.3)
- b. Conformance inspection (see 4.4)

4.2.1 Inspection conditions. Unless otherwise specified, measurements and test shall be performed at standard ambient conditions as specified in MIL-STD-810.

4.3 First Article inspection.

4.3.1 Submission. The contractor shall submit a first article sample as designated by the Contracting Officer. The first article sample shall consist of two (2) BTAs and two (2) CCs selected from the first 15 BTAs and 15 CCs produced or as otherwise specified in the contract. For the MBDs, the first article sample shall consist two (2) MBDs and two (2) CCs selected from the first 15 M26A2 and M27A2 MBDs and the first 15 corresponding CCs produced or as otherwise specified in the contract. The first article sample shall be inspected in accordance with 4.3.2. A First Article Test (FAT) Procedure shall be prepared by the contractor and shall be submitted to the Government for approval before the FAT inspection.

4.3.2 Inspections to be performed. As determined by the Government, the first article sample shall be subjected to any or all of the examinations and test specified in this specification (see Table II) and be inspected for compliance with any or all requirements of this specification and the applicable drawings. Environmental Characteristics specified in 4.5.3.2, 4.5.3.3 and 4.5.3.4 shall be performed with the BTA and MBDs cased in CCs. The contractor shall verify the performance Characteristics after each environmental exposure of 4.5.3.

4.3.3 Rejection. If any test sample fails to comply with any of the applicable requirements, the first article sample shall be rejected. The Government reserves the right to terminate inspection upon any failure of an assembly to comply with any of the requirements.

4.3.4 First article units. BTAs and MBDs used in the First Article tests are not deliverable and shall be marked "Do Not Use".

4.4 Conformance inspection. All deliverable assemblies shall be subjected to Conformance Inspection. See Table II, Examination and Tests, in column CI for requirements and frequencies of inspection.

TABLE II. Examination and Tests.

Characteristics	Requirement Paragraph	Verification Methods	FAT for initial production	Conformance Inspection (CI)
Performance requirements				
Collimation	3.3.1	4.5.1.1	x	100%
Collimation Repeatability	3.3.2	4.5.1.2	x	100%
Parallax	3.3.3	4.5.1.3	x	100%
Field of View (FOV)	3.3.4	4.5.1.4	x	100%
Resolution	3.3.5	4.5.1.5	x	100%
Focusing Range	3.3.6	4.5.1.6	x	100%
Magnification	3.3.7	4.5.1.7	x	100%
Diopter Range	3.3.8	4.5.1.8	x	100%
Sealing	3.3.9	4.5.1.9	x	100%
Physical characteristics				
Optical components	3.4.3	4.5.2.1	x	100%
Optical coating	3.4.4	4.5.2.2	x	100%
Reticle	3.4.5	4.5.2.3	x	100%
Reticle adjustment	3.4.6	4.5.2.4	x	100%
Eye relief	3.4.7	4.5.2.5	x	100%
Exit pupil	3.4.8	4.5.2.6	x	100%
Pressurization	3.4.9	4.5.2.7	x	100%
Purging	3.4.10	4.5.2.8	x	control
Finish	3.4.11	4.5.2.9	x	coc
Lubricant	3.4.12	4.5.2.10	x	coc
Environmental		4.5.3		
Operation temperature	3.5.1	4.5.3.1	x	control
Storage temperature	3.5.2	4.5.3.2	x	control
Vibration	3.5.3	4.5.3.3	x	control
BTA shock	3.5.4	4.5.3.4.1	x	control
MBD shock	3.5.4	4.5.3.4.2	x	

TABLE II. Examination and Tests - Continued.

Characteristics	Requirement Paragraph	Verification Methods	FAT for initial production	Conformance Inspection (CI)
Bench handling	3.5.5	4.5.3.4.3	x	control
Altitude	3.5.6	4.5.3.6	x	
Salt fog	3.5.7	4.5.3.7	x	
Dust	3.5.8	4.5.3.8	x	
Workmanship	3.6	4.5.4	x	100%

Note: 100% = 100% inspection required. control = 1 out of every 50 produced. 1/200 = 1 out of every 200 produced after three consecutive successes. coc = certificate of conformance. x = required for First Article test.

4.4.1 Environmental control. One BTA in one CC, as a control sample, shall be selected at random by a designated Government representative from each 50 BTAs and 50 CCs produced or from each month's production, whichever occurs first. Upon success of the first three consecutive environmental control tests, the control sample may be increased to 200 BTAs and 200 CCs produced or from each month's production, whichever occurs first. All requirements as indicated with "control" in the CI column of Table II shall be utilized for environmental controls. All requirements cited in this paragraph for the BTA shall also apply to the M26A2 and M27A2 MBDs. One M26A2 or M27A2 MBD in one CC will constitute one control sample.

4.5 Method of verification. The methods of verification are categorized as follows:

a. Examination. Non-destructive visual, auditory, olfactory, tactile, simple physical manipulations, gauging and measuring inspections.

b. Analysis. Analytical verification by mathematical analysis; statically analysis; evaluation of the correlation of measured data and observed test results with calculated expected value; conformance of end item with contractor generated specifications and documentation from lower tier supplier; and Government approved configuration item specifications and documentation.

c. Demonstration. The contractor shall exercise the equipment to verify that functional requirements have been met.

d. Test. Verification by actual measurement that the equipment meets the requirements of the specification when subjected to the actual conditions(or simulated conditions) specified.

4.5.1 Performance characteristics.

4.5.1.1 Collimation. A test fixture(s) simulating the required interface surface for securing the mechanical axis of the telescope and the telescope with its interface adapter shall be used to perform this test. The telescope and the telescope with its interface adapter shall be rotated 360 degrees within the fixture(s). A minimum of four readings, 90 degrees apart, shall be recorded for each configuration. Collimation is met when each of the four(4) readings is within the 20 seconds of arc collimation error. The contractor shall be responsible for providing its own test fixture(s).

4.5.1.2 Collimation repeatability. The collimation error is recorded for both the telescope and the telescope with its interface adapter inserted in the test fixture(s). Each configuration shall be withdrawn then reinserted into the test fixture(s). Collimation error is recorded and compared to the initial reading for each configuration. Repeatability within 10 seconds of arc is acceptable. Both measurements for each configuration shall meet the requirements of 3.2.2. The contractor shall be responsible for providing its own fixture(s).

4.5.1.3 Parallax. An examination and demonstration shall be performed to verify conformance to 3.3.3.

4.5.1.4 Field of view. An examination and demonstration shall be performed to verify conformance to 3.3.4.

4.5.1.5 Resolution. An examination shall be performed to verify conformance to 3.3.5.

4.5.1.6 Focusing range. An examination and demonstration shall be performed to verify conformance to 3.3.6.

4.5.1.7 Magnification. An examination shall be performed to verify conformance to 3.3.7.

4.5.1.8 Diopter range. An examination and demonstration shall be performed to verify conformance to 3.3.8.

4.5.1.9 Sealing. An examination and test shall be performed to verify conformance to 3.3.9.

4.5.2 Physical characteristics.

4.5.2.1 Optical components. Verification shall be performed as specified in MIL-O-13830 to verify conformance to 3.4.3.

4.5.2.2 Optical coating. Verification shall be performed as specified in MIL-C-675 to verify conformance to 3.4.4.

4.5.2.3 Reticle. An examination shall be performed to verify conformance to 3.4.5.

4.5.2.4 Reticle adjustment. An examination and demonstration shall be performed to verify conformance to 3.4.6.

4.5.2.5 Eye relief. An examination and demonstration shall be performed to verify conformance to 3.4.7.

4.5.2.6 Exit Pupil. An examination and demonstration shall be performed to verify conformance to 3.4.8.

4.5.2.7 Pressurization. An examination and test shall be performed to verify conformance to 3.4.9.

4.5.2.8 Purging. An examination shall be performed to verify conformance to 3.4.10.

4.5.2.9 Finish. A COC shall be provided to verify conformance to 3.4.11.

4.5.2.10 Lubricant. An examination shall be performed to verify that all moving parts shall freely move in the condition as specified in 3.4.12.

4.5.3 Environmental.

4.5.3.1 Operating temperature.

4.5.3.1.1 High temperature. Expose the cased BTA to the high storage temperature as specified in 3.5.2. The cased BTA shall be soaked for a minimum of 5 hours after the entire assembly stabilizes at the high storage temperature. The contractor shall return the assembly to the high operating temperature cited in 3.5.1 and verify the BTA conforms to 3.3. Additionally, the contractor, if required to, shall perform the same test on the CC and verify its conformance to 3.6. Both MBDs shall also meet all high temperature requirements specified in this paragraph.

4.5.3.1.2 Low temperature. Expose the cased BTA to the low storage temperature as specified in 3.5.2. The cased BTA shall be soaked for 5 hours (min.) after the entire assembly stabilizes at the low storage temperature. The contractor shall return the assembly to the low operating temperature specified in 3.5.1 and verify the BTA conforms to 3.3. Additionally, the contractor, if required to, shall perform the same test on the CC and verify its conformance to 3.6. Both MBDs shall also meet all low temperature requirements cited in this paragraph.

4.5.3.2 Storage temperature. Successful completion of the high and low temperature tests of 4.5.3.1 verifies the conformance to the storage temperature requirement cited in 3.5.2.

4.5.3.3 Vibration. Subject the BTA cased in the CC to the vibration test as specified in Procedure I, Category 1, Method 514 of MIL-STD-810. The vibration profile shall be 84 minutes of sinusoidal vibration in each of the three mutually perpendicular axes at standard

ambient condition. The vibration levels shall consist of logarithmic sweeps from 5 to 200 to 5 Hz applied in each axis for 12 minutes. The amplitude and frequency of vibration are as specified in 3.5.3. At the end conclusion of this test, the BTA shall be examined to verify conformance to the requirements of 3.3. The MBDs cased in the CCs shall also meet all the vibration requirements cited in this paragraph.

4.5.3.4 Shock.

4.5.3.4.1 BTA Shock. Subject the BTA cased in CC to shock test as specified in Procedure I, Method 516 of MIL-STD-810. The shock profile shall be three shock impulses of $30 + 3g$'s, $11.0 + 1.1$ milliseconds(ms) half sine wave applied in each of three mutually perpendicular axes. At the conclusion of the test, verify that the BTA conforms to the requirement of 3.3.

4.5.3.4.2 MBD Shock. Subject the MBDs cased in CCs to shock test as specified in Procedure I, Method 516 of MIL-STD-810. The shock profile shall be three shock impulses of $40 + 4g$'s, $11.0 + 1.1$ milliseconds(ms) half sine wave applied in each of three mutually perpendicular axes. At the conclusion of the test, verify that the MBDs conform to the requirements of 3.3.

4.5.3.4.3 Bench handling. Subject the BTA and MBDs to the bench handling shock as specified in Procedure VI, Method 516 of MIL-STD-810. At the conclusion of the test, the BTA and MBDs shall be examine to verify conformance to the requirements of 3.3.

4.5.3.5 Altitude. Subject the BTA and MBDs to the altitude as specified in procedure I, Method 500 of MIL-STD-810. The altitude change rate shall be at lease 457.2 meters/min. (1,500 ft/min.). At the conclusion of the test, the BTA and MBDs shall be examine to verify conformance to requirements of 3.3.

4.5.3.6 Humidity. Subject the BTA and the MBDs to the humidity test as specified in Procedure III, Method 507 of MIL-STD-810. During and after the test verify that the BTA and MBDs conform to the requirement of 3.3.

4.5.3.7 Salt fog. Subject the BTA and MBDs to the salt test as specified in Procedure I, Method 510 of MIL-STD-810 for 48 hours. At the conclusion of the test, verify that the BTA and MBDs conform to the requirements of 3.3.

4.5.3.8 Dust. Subject the BTA and the MBDs to the blowing dust test as specified in Procedure I, Method 510 of MIL-STD-810. At the conclusion of the test, verify that the BTA and the MBDs conform to the requirements of 3.3.

4.5.4 Workmanship. The BTA and MBDs and their CCs shall be examined to verify conformance to 3.6.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The Boresight Telescope Assembly is specifically used for precise sight alignment of the Bradley Fighting Vehicle system. The M26A2 and M27A2 Muzzle Boresight Devices are specifically used for precise sight alignment of the Abrams Tank Family of Vehicle System.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and, if required, the specific issue of individual documents referenced (see 2.1.1).
- c. Requirements for submission of first article sample.
- d. Requirements for submission of inspection equipment designs.
- e. Applicable stock number.
- f. Packaging requirements: The level of packing/packing shall be A/B. The MBD may be cased in Carrying Case PN 12956803 or equivalent. Case shall be closed and latches shall be secured. Filler per A-A-1898 or equivalent may be used to create a tight pack. Close in accordance with ASTM D 1974. Packaging/Packing for the BTA shall conform to commercial level in accordance with ASTM D3951. The BTA shall be cased in Carrying Case PN 12977226. Unless otherwise specified, marking for shipment and storage shall be in accordance with MIL-STD-129.
- g. Serialization requirements, if applicable.
- h. Certificate of conformance for each lot or shipment of product.

6.3 Technical manuals. The requirement for technical manuals should be considered when this specification is applied on a contract. If technical manuals are required, specifications and standards that have been cleared and listed in DOD 5010.12, Acquisition Management Systems and Data Requirements Control List (AMSDDL) must be listed on a separate Contract Data Requirements List (DD Form 1423), which is included as an exhibit to the contract. The technical manuals must be acquired under separate contract line item in the contract.

6.4 Submission of contractor inspection equipment designs for approval. Submit copies of the designs as required to: Commander, US Army ARDEC, AMSTA-AR-QAC-F, Picatinny Arsenal, NJ 07806-5000. This address will be specified on the Contract Data Requirements List, DD Form 1423 in the contract.

6.5 Submission of alternative conformance provisions. All contractor proposed alternative conformance provisions will be submitted to the Government for evaluation/approval as directed by the contracting activity.

6.6 Supersession data. This specification supersedes drawing 12977225, dated 14 August 1995.

6.7 Drawings. Drawings listed in Section 2 of this specification under the heading US Army Armament Research, Development and Engineering Center (ARDEC) may also include drawings prepared by, and identified as US Army Tank Automotive Command (TACOM), US Army Armament, Research and Development Command (ARRADCOM), Frankford Arsenal, Rock Island Arsenal or Picatinny Arsenal drawings. Technical data originally prepared by these activities is now under cognizance of ARDEC.

6.8 Subject term (key word) listing.

Alignment
Carrying case
Interface
Muzzle

Custodian:
Army-AR

Preparing activity:
Army-AR

(Project 1240-0018)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:		1. DOCUMENT NUMBER MIL-PRF-71223		2. DOCUMENT DATE (YYMMDD) 960917	
3. DOCUMENT TITLE Telescope Assembly, Boresight, Common					
4. NATURE OF CHANGE (<i>Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.</i>)					
5. REASON FOR RECOMMENDATION					
6. SUBMITTER					
a. NAME (<i>Last, First, Middle Initial</i>)			b. ORGANIZATION		
c. ADDRESS (<i>Include Zip Code</i>)			d. TELEPHONE (<i>Include Area Code</i>) (1) Commercial (2) AUTOVON (<i>if applicable</i>)		7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY					
a. NAME U. S. Army ARDEC			b. TELEPHONE (<i>Include Area Code</i>) (1) Commercial (2) AUTOVON (201) 724-6671 880-6671		
c. ADDRESS (<i>Include Zip Code</i>) ATTN: AMSTA-AR-EDE-S, B-12 Picatinny Arsenal, NJ 07806-5000			IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340		